

**CLAIMS**

What is claimed is:

- 5     1. A method within a server device for facilitating a remote boot process in a client device, wherein the client device and the server device reside on a network, the method comprising the steps of:  
receiving at the server device a boot request from  
10    the client device, wherein the client device requires boot files uniquely configured for the client device;  
in response to receiving the boot request,  
generating a boot response to the client device that directs the client device to download boot files from the  
15    server device; and  
sending a boot response to the client device,  
wherein the boot response directs the client device to download boot files from the server device, wherein the server device is one of a plurality of boot servers on the network, and wherein the server device is able to respond to a boot request from all client devices on the  
20    network.
2. The method of claim 1 further comprising:  
prior to sending a boot response to the client  
25    device, determining that the server device has sufficient resources to service a remote boot process for an additional client device.

3. A method within a server device for facilitating a remote boot process in a client device, wherein the client device and the server device reside on a network, the method comprising the steps of:

5 receiving at the server device a boot request from the client device, wherein the server device is one of a plurality of boot servers on the network, and wherein the server device is able to respond to a boot request from any client device on the network;

10 determining whether or not the server device is able to service an additional boot request; and

in response to a determination that the server device is able to service an additional boot request, sending a boot response to the client device, wherein the boot response directs the client device to download boot files from the server device.

4. The method of claim 3 further comprising:

executing a proxy DHCP (Dynamic Host Configuration Protocol) service on the server device for processing a boot request, wherein a boot request is formatted as a PXE-extended (Preboot Execution Environment extended) DHCP Request message, and wherein the boot response is a PXE-extended DHCP Ack message.

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5. The method of claim 3 further comprising:

executing a boot service on the server device for processing a PXE-extended Boot Service Discover message from a client.

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6. A method within a server device for facilitating a PXE-compliant (Preboot Execution Environment compliant) remote boot process in a client device, wherein the client device and the server device reside on a network,  
5 the method comprising the steps of:

receiving at the server device a PXE-extended DHCP (Dynamic Host Configuration Protocol) Request message from the client device, wherein the server device is one of a plurality of boot servers on the network, and  
10 wherein the server device is able to respond to a PXE-extended DHCP Request message from any client device on the network;

15 processing the received PXE-extended DHCP Request message within a Proxy DHCP service on the server device; and

20 sending from the server device a PXE-extended DHCP Ack message to the client device, wherein the PXE-extended DHCP Ack message directs the client device to download boot files from the server device.

25 7. The method of claim 6 further comprising:

receiving at the server device a PXE-extended Boot Service Discover message from the client device; and

25 processing the received PXE-extended Boot Service Discover message within a boot service on the server device; and

sending from the server device a PXE-extended Boot Service Ack message to the client device.

PROVISIONAL PATENT DRAWINGS

8. The method of claim 7 further comprising:  
receiving at the server device an NBP (Network  
Bootstrap Program) Download Request message from the  
client device; and  
5 processing the received NBP Download Request message  
within a TFTP (Trivial File Transfer Protocol) service on  
the server device; and  
downloading from the server device an NBP file to  
the client device.
- 10 9. The method of claim 6 further comprising:  
prior to sending the PXE-extended DHCP Ack message  
to the client device, determining that the server device  
has sufficient resources to service a remote boot process  
15 for an additional client device.
10. The method of claim 6 further comprising:  
employing a self-throttling process to prevent the  
server device from servicing an additional remote boot  
process for an additional client device if the server  
device has insufficient resources for servicing an  
additional remote boot process.
- 20 11. The method of claim 10 further comprising:  
executing a boot service daemon for monitoring an  
availability of the server device to adequately service  
additional remote boot processes.

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12. The method of claim 11 further comprising:  
computing the availability of the server device to  
adequately service an additional remote boot process  
based upon resources within the server device.
  
  13. The method of claim 11 further comprising:  
computing the availability of the server device to  
adequately service an additional remote boot process  
based upon resources within at least two boot servers in  
the plurality of boot servers on the network.

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14. The method of claim 10 further comprising:  
communicating an indication of available resources  
within the server device to at least one other boot  
server in the plurality of boot servers on the network.

15. The method of claim 10 further comprising:  
stopping or suspending the Proxy DHCP service on the  
server device if the server device has insufficient  
resources for servicing an additional remote boot  
process.

16. The method of claim 10 further comprising:  
restarting the Proxy DHCP service on the server  
device if the server device has sufficient resources for  
servicing an additional remote boot process.

17. The method of claim 10 further comprising:  
communicating an execution status of the Proxy DHCP  
service on the server device to at least one other boot  
server in the plurality of boot servers on the network.

18. An apparatus within a server device for facilitating a remote boot process in a client device, wherein the client device and the server device reside on a network, the apparatus comprising:

5 receiving means for receiving at the server device a boot request from the client device, wherein the client device requires boot files uniquely configured for the client device;

10 generating means for generating a boot response to the client device that directs the client device to download boot files from the server device in response to receiving the boot request; and

15 sending means for sending a boot response to the client device, wherein the boot response directs the client device to download boot files from the server device, wherein the server device is one of a plurality of boot servers on the network, and wherein the server device is able to respond to a boot request from all client devices on the network.

20 19. The apparatus of claim 18 further comprising:

determining means for determining that the server device has sufficient resources to service a remote boot process for an additional client device prior to sending a boot response to the client device.

20. An apparatus within a server device for facilitating a remote boot process in a client device, wherein the client device and the server device reside on a network, the apparatus comprising:

5 receiving means for receiving at the server device a boot request from the client device, wherein the server device is one of a plurality of boot servers on the network, and wherein the server device is able to respond to a boot request from any client device on the network;

10 determining means for determining whether or not the server device is able to service an additional boot request; and

15 sending means for sending a boot response to the client device in response to a determination that the server device is able to service an additional boot request, wherein the boot response directs the client device to download boot files from the server device.

21. The apparatus of claim 20 further comprising:

20 first executing means for executing a proxy DHCP (Dynamic Host Configuration Protocol) service on the server device for processing a boot request, wherein a boot request is formatted as a PXE-extended (Preboot Execution Environment extended) DHCP Request message, and  
25 wherein the boot response is a PXE-extended DHCP Ack message.

22. The apparatus of claim 20 further comprising:

30 second executing means for executing a boot service on the server device for processing a PXE-extended Boot Service Discover message from a client.

23. An apparatus within a server device for facilitating  
a PXE-compliant (Preboot Execution Environment compliant)  
remote boot process in a client device, wherein the  
client device and the server device reside on a network,  
5 the apparatus comprising:

first receiving means for receiving at the server  
device a PXE-extended DHCP (Dynamic Host Configuration  
Protocol) Request message from the client device, wherein  
the server device is one of a plurality of boot servers  
10 on the network, and wherein the server device is able to  
respond to a PXE-extended DHCP Request message from any  
client device on the network;

15 first processing means for processing the received  
PXE-extended DHCP Request message within a Proxy DHCP  
service on the server device; and

20 first sending means for sending from the server  
device a PXE-extended DHCP Ack message to the client  
device, wherein the PXE-extended DHCP Ack message directs  
the client device to download boot files from the server  
device.

24. The apparatus of claim 23 further comprising:

25 second receiving means for receiving at the server  
device a PXE-extended Boot Service Discover message from  
the client device; and

second processing means for processing the received  
PXE-extended Boot Service Discover message within a boot  
service on the server device; and

30 second sending means for sending from the server  
device a PXE-extended Boot Service Ack message to the  
client device.

25. The apparatus of claim 24 further comprising:  
third receiving means for receiving at the server  
device an NBP (Network Bootstrap Program) Download  
Request message from the client device; and  
5 third processing means for processing the received  
NBP Download Request message within a TFTP (Trivial File  
Transfer Protocol) service on the server device; and  
downloading means for downloading from the server  
10 device an NBP file to the client device.

26. The apparatus of claim 23 further comprising:  
determining means for determining that the server  
device has sufficient resources to service a remote boot  
15 process for an additional client device prior to sending  
the PXE-extended DHCP Ack message to the client device.

27. The apparatus of claim 23 further comprising:  
employing means for employing a self-throttling  
20 process to prevent the server device from servicing an  
additional remote boot process for an additional client  
device if the server device has insufficient resources  
for servicing an additional remote boot process.

25 28. The apparatus of claim 27 further comprising:  
first executing means for executing a boot service  
daemon for monitoring an availability of the server  
device to adequately service additional remote boot  
processes.

29. The apparatus of claim 28 further comprising:  
first computing means for computing the availability  
of the server device to adequately service an additional  
remote boot process based upon resources within the  
server device.

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30. The apparatus of claim 28 further comprising:  
second computing means for computing the  
availability of the server device to adequately service  
an additional remote boot process based upon resources  
within at least two boot servers in the plurality of boot  
servers on the network.

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31. The apparatus of claim 27 further comprising:  
first communicating means for communicating an  
indication of available resources within the server  
device to at least one other boot server in the plurality  
of boot servers on the network.

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32. The apparatus of claim 27 further comprising:  
means for stopping or suspending the Proxy DHCP  
service on the server device if the server device has  
insufficient resources for servicing an additional remote  
boot process.

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33. The apparatus of claim 27 further comprising:  
restarting means for restarting the Proxy DHCP  
service on the server device if the server device has  
sufficient resources for servicing an additional remote  
boot process.

34. The apparatus of claim 27 further comprising:  
second communicating means for communicating an  
execution status of the Proxy DHCP service on the server  
device to at least one other boot server in the plurality  
of boot servers on the network.

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35. A computer program product in a computer readable medium for use within a server device for facilitating a remote boot process in a client device, wherein the client device and the server device reside on a network,  
5 the computer program product comprising:

instructions for receiving at the server device a boot request from the client device, wherein the client device requires boot files uniquely configured for the client device;

10 instructions for generating a boot response to the client device that directs the client device to download boot files from the server device in response to receiving the boot request; and

15 instructions for sending a boot response to the client device, wherein the boot response directs the client device to download boot files from the server device, wherein the server device is one of a plurality of boot servers on the network, and wherein the server device is able to respond to a boot request from all  
20 client devices on the network.

36. The computer program product of claim 35 further comprising:

25 instructions for determining that the server device has sufficient resources to service a remote boot process for an additional client device prior to sending a boot response to the client device.

37. A computer program product in a computer readable medium for use within a server device for facilitating a remote boot process in a client device, wherein the client device and the server device reside on a network,  
5 the computer program product comprising:

instructions for receiving at the server device a boot request from the client device, wherein the server device is one of a plurality of boot servers on the network, and wherein the server device is able to respond  
10 to a boot request from any client device on the network;

instructions for determining whether or not the server device is able to service an additional boot request; and

instructions for sending a boot response to the client device, wherein the boot response directs the client device to download boot files from the server device in response to a determination that the server device is able to service an additional boot request.

20 38. The computer program product of claim 37 further comprising:

instructions for executing a proxy DHCP (Dynamic Host Configuration Protocol) service on the server device for processing a boot request, wherein a boot request is  
25 formatted as a PXE-extended (Preboot Execution Environment extended) DHCP Request message, and wherein the boot response is a PXE-extended DHCP Ack message.

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39. The computer program product of claim 37 further comprising:

5 instructions for executing a boot service on the server device for processing a PXE-extended Boot Service Discover message from a client.

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40. A computer program product in a computer readable medium for use within a server device for facilitating a PXE-compliant (Preboot Execution Environment compliant) remote boot process in a client device, wherein the 5 client device and the server device reside on a network, the computer program product comprising:

instructions for receiving at the server device a PXE-extended DHCP (Dynamic Host Configuration Protocol) Request message from the client device, wherein the 10 server device is one of a plurality of boot servers on the network, and wherein the server device is able to respond to a PXE-extended DHCP Request message from any client device on the network;

15 instructions for processing the received PXE-extended DHCP Request message within a Proxy DHCP service on the server device; and

20 instructions for sending from the server device a PXE-extended DHCP Ack message to the client device, wherein the PXE-extended DHCP Ack message directs the client device to download boot files from the server device.

41. The computer program product of claim 40 further comprising:

instructions for receiving at the server device a PXE-extended Boot Service Discover message from the client device; and

instructions for processing the received PXE-extended Boot Service Discover message within a boot service on the server device; and

instructions for sending from the server device a PXE-extended Boot Service Ack message to the client device.

42. The computer program product of claim 41 further comprising:

instructions for receiving at the server device an NBP (Network Bootstrap Program) Download Request message from the client device; and

instructions for processing the received NBP Download Request message within a TFTP (Trivial File Transfer Protocol) service on the server device; and

instructions for downloading from the server device an NBP file to the client device.

43. The computer program product of claim 40 further comprising:

instructions for determining that the server device has sufficient resources to service a remote boot process for an additional client device prior to sending the PXE-extended DHCP Ack message to the client device.

44. The computer program product of claim 40 further comprising:

instructions for employing a self-throttling process to prevent the server device from servicing an additional remote boot process for an additional client device if the server device has insufficient resources for servicing an additional remote boot process.

45. The computer program product of claim 44 further comprising:

instructions for executing a boot service daemon for monitoring an availability of the server device to adequately service additional remote boot processes.

46. The computer program product of claim 45 further comprising:

instructions for computing the availability of the server device to adequately service an additional remote boot process based upon resources within the server device.

47. The computer program product of claim 45 further comprising:

instructions for computing the availability of the server device to adequately service an additional remote boot process based upon resources within at least two boot servers in the plurality of boot servers on the network.

48. The computer program product of claim 44 further comprising:

instructions for communicating an indication of available resources within the server device to at least one other boot server in the plurality of boot servers on the network.

49. The computer program product of claim 44 further comprising:

10 instructions for stopping or suspending the Proxy  
DHCP service on the server device if the server device  
has insufficient resources for servicing an additional  
remote boot process.

15 50. The computer program product of claim 44 further comprising:

instructions for restarting the Proxy DHCP service on the server device if the server device has sufficient resources for servicing an additional remote boot process.

51. The computer program product of claim 44 further comprising:

25 instructions for communicating an execution status  
of the Proxy DHCP service on the server device to at  
least one other boot server in the plurality of boot  
servers on the network.